Poincaré - Selberg - Ruelle
a mathematical golden braid

Once you have a drum, you would like to hear its sound (Kac was interested in knowing the shape of the drum from its sound, but forget about this problem for this seminar). If your "drum" is the Poincaré half-plane, you have to find the eigenvalues of the hyperbolic Laplacian. This very simple question has given rise to beautiful theories in diverse areas of mathematics. In the first part of the seminar, we will give a very brief description of the problem and of Selberg approach. Then we will turn our attention to the dynamical systems point of view, and in particular to the Ruelle thermodynamical formalism. The aim is to show that there is a strong connection between Ruelle theory for dynamical systems on the Poincaré half-plane and Selberg approach. This connection is realized by the Gauss map on the interval, which can be obtained as a return map for the geodesic flow on the Poincaré half-plane.

The flavour of the seminar will be introductory, with no "too" technical details, so that it can be attended by non-specialists and students.